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Helminths of green toads *Bufo viridis* Laurenti, 1789 and spiny tailed lizards, *Uromastyx microlepis* Blanford, 1874 of Kuwait

by
O. Sey and L. Al-Ghaith
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Abstract: Specimens of *Bufo viridis* and *Uromastyx microlepis* collected in Kuwait were examined for helminths. A total of 9 species of helminths were revealed: *Polystoma integerrimum, Sonsinotrema tacapense, Nematotaenia dispar, Aplectana macinthosii, Cosmocerca ornata, Rhabdias bufonis* from *Bufo viridis* and *Oochoristica truncata, Thelandros kanistica, Tachygonetria vivipara* from *Uromastyx microlepis*. All the species except *Nematotaenia dispar* were recorded for the first time from Kuwait and *Oochoristica truncata, Thelandros kanistica* and *Tachygonetria vivipara* are new host records.
Keywords: helminth parasites, amphibians, reptiles, Kuwait

Introduction

A survey of the available literature indicates the paucity of information on the helminth parasites of amphibians and reptiles of Kuwait, although Kuwait has an interesting herpetofauna and their parasites might have a special interest both from taxonomical and zoogeographical points of view. Until now there are no detailed and systematic investigations from Kuwait in this respect and so far as we are aware only fragments of the cestode, *Nematotaenia dispar* have been reported by Jones (1987) from *Bufo* sp. Although none of the helminth parasites treated in this paper is new to science, they are nevertheless new to Kuwait or in some of the adjacent countries. The authors' intention was to give a preliminary report on the helminth parasites of the hosts in question assuming that it will inspire further such investigations especially in Kuwait.

Materials and methods

Twenty five specimens of green toads, obtained from the southern district of Kuwait (Wafra) between October-November 1996 and 18 specimens of spiny tailed lizards, collected in the suburban desert of Kuwait City, between October 1996 and December 1997, were examined for helminths. The worms were washed in saline, fixed in AFA (Aceticacid : Formaldehyde : Alcohol) and stored in 70% ethanol. Monogeneans, Trematodes and Cestodes were stained in alum carmine, destained in diluted HCL, dehydrated in ascending concentration of ethanol, cleared in clove oil and mounted in Canada balsam. Nematodes were stored in glycerin-alcohol and cleared in lactophenol for examination. All measurements are expressed in micrometers, drawings of the worms were prepared by microprojector and details filled in through microscopic observation.

Results and discussion

The community structure of the helminth parasites of the examined hosts is summarized in Table 1.

Table 1: Helminths detected in *Bufo viridis* and *Uromastyx microlepis*

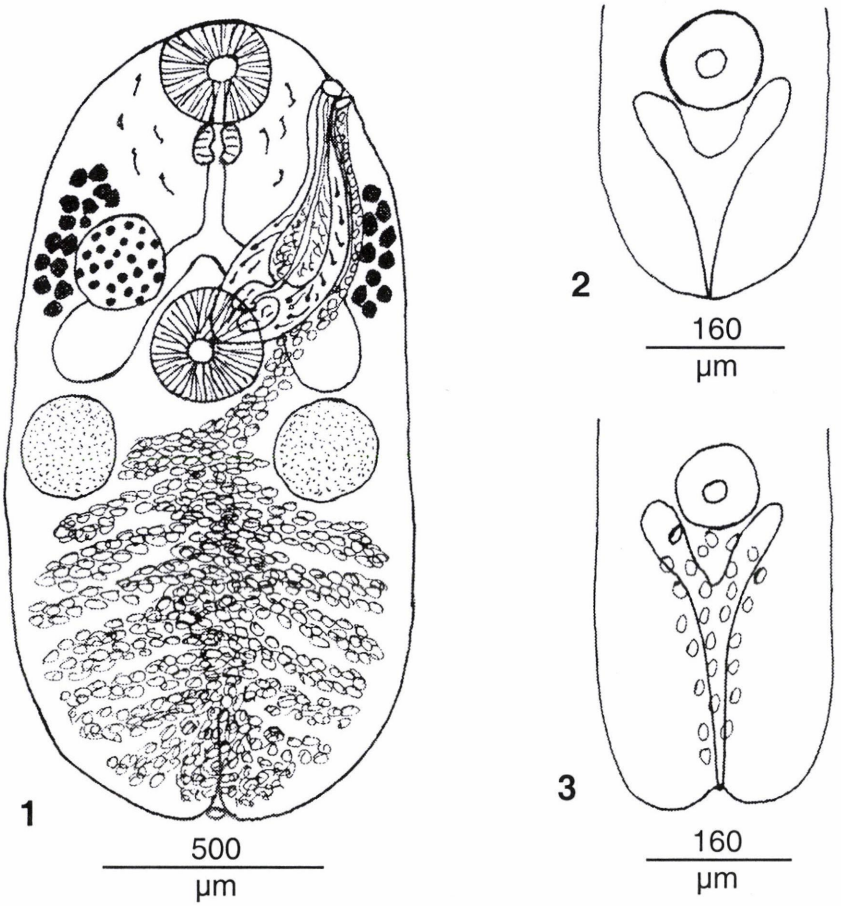
	Location in hosts	Prevalence	Mean intensity	Abundance
Bufo viridis				
Monogenea				
Polystoma integerrimum	bladder	16.0	4.0	0.64
Trematoda				
Sonsinotrema tacapense	intestine	23.0	5.5	1.32
Cestoda				
Nematotaenia dispar	intestine	52.0	5.1	2.60
Nematoda				
Aplectana macintoshii	intestine	32.0	4.8	1.53
Cosmocerca ornata	intestine and cyst	36.0	7.7	2.77
Rhabdias bufonis	lung	20.0	4.8	1.50
Uromastyx microlepis				
Cestoda				
Oochoristica truncata	intestine	61.1	3.3	2.00
Nematoda				
Tachygonetria vivipara	caecum	72.2	519.2	374.90
Thelandros kanistica	rectum	33.3	34.8	11.50

Polystoma integerrimum (Fröhlich, 1791)

Following the key recommended by Vojtkova (1989) for European species (based on the intestinal stucture) and Euzet *et al.* (1974) (based on the shape and measurements of the hamuli) the Kuwaiti specimens fall within this species. The intestinal stucture shows sometimes the typical arrangement, but the number of the transversal anastomoses may vary from two several ones. The measurements of the hamuli is smaller (1.6–1.8). This species is broadly distributed in the Palearctic realm, in the adjacent countries it was reported from Saudi Arabia (Nasher 1979, Fernando 1989).

Sonsinotrema tacapense (Sonsino, 1894) (Figs. 1–3)

The genus *Sonsinotrema* was set up by Balozet Callot (1938) for the species, *Distomum tacapense* Sonsino, 1894. Among the subsequent authors, Skarbilovich (1948), Dollfus (1951), Khotenovski (1970) have accepted the validity of this genus while others, Dawes (1946), Yamaguti (1971) regarded it to be a synonym of the genus *Pleurogenoides* Travassos, 1921. Khotenovski (1970) and Yamaguti (1971) applied different characters for the separation of the species-groups (genera) of the subfamily Pleurogeninae Looss, 1899. Yamaguti (1971) combined the oesophageal length with extracaecal ovary and V-shaped excretory vesicle (Pleurogenoides) and short oesophagus combined with intracaecal ovary and Y-shaped excretory vesicle (Pseudosonsinotrema Dollfus, 1951); while Khotenovski (1970) differentiated the genus *Sonsinotrema* from *Pseudosonsinotrema* on the basis of the form of excretory vesicle (U-shaped in *Pseudosonsinotrema* and Y-shaped in *Sonsinotrema*) and the presence (*Pseudosonsinotrema*) or absence (*Sonsinotrema*) of a muscular metraterm.



Figs. 1–3. *Sonsinotrema tacapense*. 1 – ventral wiew 2 – juvenile worm with excretory vesicle 3 – young mature worm with excretory vesicle

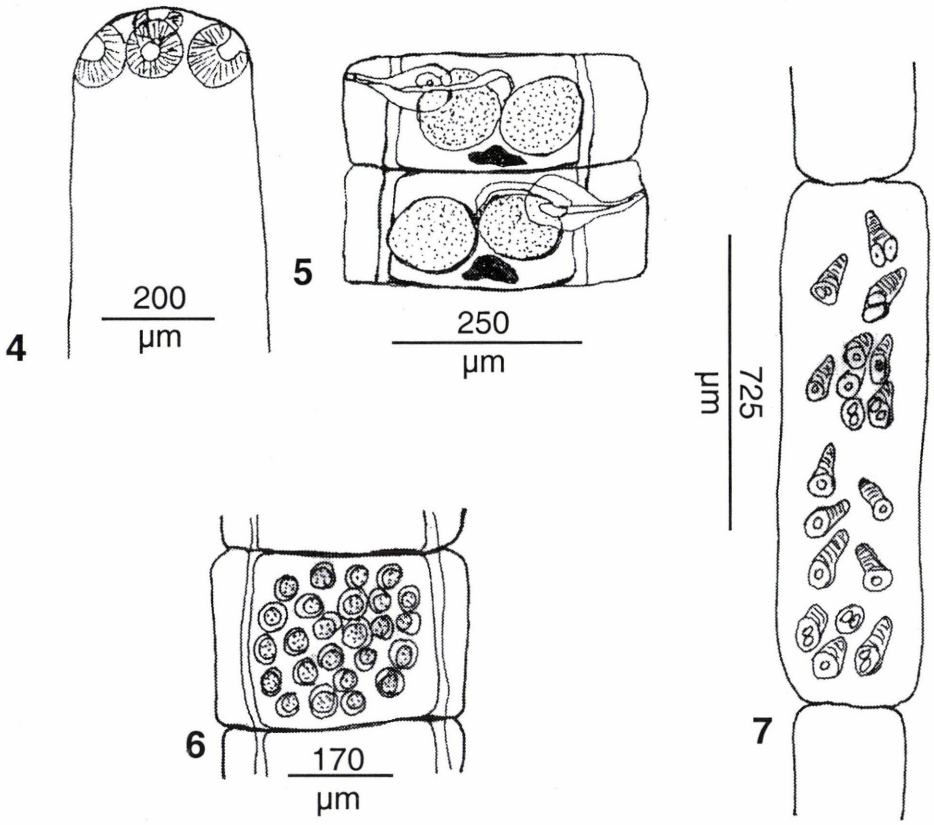
Specimens from the Kuwaiti toads can be placed more comfortably in the genus *Sonsinotrema* due to its long oesophagus, caecal ovary, Y-shaped excretory vesicle than into other related genera (*Pleurogenoides, Pseudosonsinotrema*); therefore, our observations support the validity of the genus *Sonsinotrema*. Taking the above mentioned considerations into account *Pseudosonsinotrema saudii* Ramadan, Banaja & Saoud, 1980 is very similar to *Sonsinotrema tacapense* or it can be regarded as a junior synonym of the latter species (Ramadan *et al.* [1980]) seemingly did not consult with Khotenovski's paper [1970]).

From the adjacent areas three additional pleurogenoid species have been reported: *Pleurogenoides petropedalis* Williams & Coker, 1967 from *Bufo regularis* of Egypt (Hassan, 1988), *Pleurogenoides compactus* (Strom, 1940), *Pleurogenoides stromi* (Travassos, 1930) from *Rana ridibunda* of Saudi Arabia (Fernando, 1989) *Pseudosonsinotrema saudii* Ramadan, Banaja & Saoud, 1980 from *Rana ridibunda* of Saudi Arabian (Ramadan *et al.* 1980). *Sonsinotrema tacapense* has North African and Arabian distribution.

Nematotaenia dispar (Schrank, 1782) (Figs. 4–7)

This cestode is the single parasitic species in local amphibians with a high prevalence throughout the period of examination. Results of the examination of numerous whole mounts indicate a considerable infraspecific variability supporting Jones' (1987) observation, stated in his taxonomic revision of the family Nematotaeniidae. The number of the paruterin organs in the pregravid segments and the paruterin capsules in the gravid segments may vary 24–32 and 13–24, respectively.

This species is broadly distributed in Europe, the Middle East, North Africa, India and South East Asia. It was reported for the first time in Kuwait (2 fragments from *Bufo* sp.) by Jones (1987).



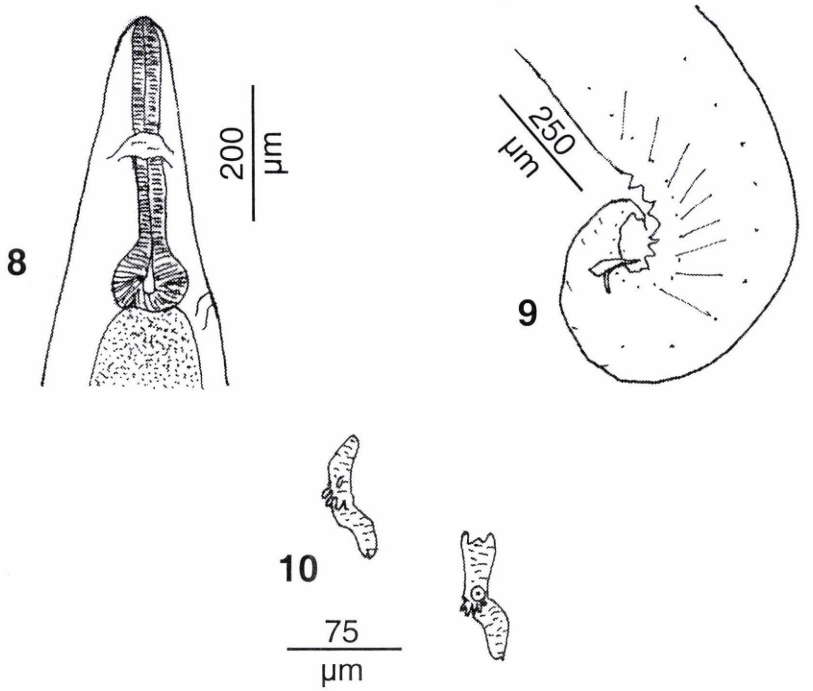
Figs. 4–7. *Nematotaenia dispar*. 4 – scolex and neck 5 – mature segments
6 – pregravid segment 7 – gravid segment

Aplectana macintoshii (Steward, 1914)

This species is a broadly distributed nematode (Baker 1980) in Europe, Asia and Africa. Originally it was described from *Rana tigerina* and *Bufo stomaticus* in India and later from different other host species. A probably closely related, but not completely identified *Aplectana* sp. was reported from *Bufo orientalis* and *Hyla arborea* from Saudi Arabia (Nasher 1979).

Cosmocerca ornata (Dujardine, 1845) (Figs. 8–10)

The specimens of this species were found either in the intestine or in cysts throughout the viscera of the body. The latter forms are probably the migratory juvenils of this species.



Figs. 8–10. *Cosmocerca ornata*. 8 – head end of female 9 – tail of male 10 – plectanes

Rhabdias bufonis (Schrank, 1788)

According to Hartwich (1972, 1975), the two other related species, *Angiostomum nigrivenosus* Goeze, 1800 and *Rhabdias mikrooris* Semenov, 1929 can be regarded as synonyms of this species. While Moravec Sey (1985) are of the opinion that *R. bufonis* and the Asiatic species, *Rhabdias nipponica* Yamaguti, 1935, due to their morphological similarities are probably conspecific.

This species is a broadly distribured in the Palaearctic realm; from adjacent areas it was reported from Saudi Arabia (Nasher 1979) from *Bufo orientalis* and *Hyla arborea*.

Oochoristica truncata (Krabba, 1879)

The occurrence of this species in this agamid lizard represents a new host record. Sharpilo (1976) synonymized this species with *O. tuberculata* (Rudolphi, 1819), but *O. truncata* from the Kuwaiti lizard shows different structures of the genital organs and the number of testes also differed (50-60) supporting the validity of *O. truncata*. The specimens, collected from Kuwaiti lizards, at the same time show similarities to the species *O. najdei* Magzoub, Kasim & Shawa, 1980 but it differs, among others, by having testes in a continuous line (versus in two lateral fields), described from Egyptian lizard (*Uromastyx aegyptia*).

Uromastyx microlepis is a basicly plant-eater lizard, but ants and beetles are often found in the stomach content, and they can presumably be the intermediate hosts of this cestode. *O. truncata* is distributed in Africa and South Asia.

Tachygonetria vivipara Wedl, 1862

This was the most common nematode parasitic of the spiny tailed lizard in Kuwait 13 out of the 18 examined lizards were infected. In terms of number they were found in so high quantity in the hosts that they formed a grey-whitish coat on the surface of the caecal content, involving inviduals being in different developmental stages.

Thelandros kanistica (Magzoub, Kasim & Shawa, 1980)

This species was described by Magzoub *et al.* (1980) from the Egyptian agamid lizard (*Uromastyx aegyptia*), and was allocated to a newly erected genus *Parathelandros*. This genus, however, was preoccupied, therefore, *Parathelandros* Magzoub, Kasim & Shawa, 1980 should be regarded as a homonym and this species should be reassigned to the genus *Thelandros*.

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Authors' addresses: Dr. Ottó Sey
Department of Ecology and Zoogeography,
University of Pécs
H–7601 Pécs, Ifjúság útja 6.
Hungary

Dr. L. Al-Ghaith
Department of Biological Sciences,
Faculty of Science,
University of Kuwait
P. O. Box 5969, Kuwait.